Websites

Moving ellipsometry from materials to medicine

[L to R]: Emeritus Prof of Physics, Frank Miller & Dr John Woollam

A web site always worth a browse is the Industrial Physicist [http://www.aip.org /tip/] part of the American Institute of Physics site. A recent personality profile by Jennifer Ouellettes has been on John Woollam's career in ellipsometry. Academic researcher, turned business man, J Woollam Co Inc, was founded in Lincoln in 1987 (only a couple of years after Hittite, please note) and grown into a worldwide leader in spectroscopic ellipsometry holding than 40 patents and employing 35-plus people.

What is really appealing about Woollam (early fascinated by electromagnetics and optics) is his admission to flunking his PhD and his reaction to his lack of success, namely "to fight back even harder." He then topped his class and acquired it in '67.

Woollam used ellipsometry at University of Nebraska at Lincoln to study gallium arsenide and aluminum gallium arsenide. But frustrated by the time it took to acquire data (roughly 20 minutes for a single wavelength and several hours or a day for a full spectrum.) he decided to automate the process. The innovative instrument he produced, proved so much faster at collecting data on material properties, that former NASA scientist Samuel Alterovitz wanted to have the same. Woollam won a competitive bidding process, and an improved version of his instrument was completed in 1988.

Alterovitz' enthusiasm for the new instrument encouraged Woollam to set up a fledgling enterprise through contracts from the SBIR programme of DARPA, while NASA grants continued to partly fund his UNL research. "For a university professor to start his own company in the mid-1980s was not a common thing," says Alterovitz.

Woollam still maintains an active research program at UNL, which frequently feeds back to his company, and vice versa.

Recently, he has turned to studying biomaterials interfaces, especially protein attachment to different types of surfaces. Using spectroscopic ellipsometry, he studies and characterises molecular layers as thin as a single molecule with dimensional scales of a few nanometers.

"It is one of the greatest technical challenges I have ever encountered," he says. "I had grown accustomed to working with inorganic materials, but even ones as complex as titanium dioxide are simple compared to most biomaterials."

Among the basic problems he is studying at UNL is how proteins attach to the surface of common implant materials, such as those used in heart valves and stents.

In this his group is testing a prototype instrument developed by his company for IR ellipsometry. A protein's IR signature can indicate which molecules are present, a capability with potential applications in medical bio-sensing and possible new markets for the company's ellipsometers in biology, biochemistry, and medicine.

In fact, where the semiconductor has been the driver for analytical instrumentation, nanoscale, bio-tech has almost taken over lead position in pushing at the dimensional instruments' requirements envelope.

Jobs blossoming at Hittite

Those microwave gurus, Hittite Microwave Corp have a new website. It has a very fine section of current and archived releases that alas, only starts in 2000. For the real industrial historian what happened between 1985 and 2000 is probably crux to Hittite's powers of endurance, but is, like so much web history, sea changed or swept away. But the record shows that in 2000 Summit Partners, a private equity investor, with offices in Boston, MA and Palo Alto, CA, and themselves only founded in 1984, invested $15m and the rest is on record.

This year the company has added to its Chinese representation, with a Beijing sales office and among various new products, released a designers' guide catalogue. What is really neat however, is a new parametric product search web tool designed for RF engineers. This allows the design engineer to specify the important parameters of the required product and view the Hittite products that match their requirement in a specification-compliant format.

Unlike conventional search engines, which eliminate products that narrowly fall outside specification, the parametric product search tool can show these, allowing engineers to make the intelligent design trade-off decisions and "fine tune" the requirement to their needs.

Browsers who wander into the 'How to buy section' will find that, (right at the bottom of the page), Hittite Microwave Corporation products are also distributed in the Americas by Future Electronics. You may contact Future at 800-FUTURE-1, ext. 2754. [www.futureelectronics.com/rf]. There, it must be admitted, the white and green are light and bright and Future is inviting you "to leverage our RF resources." Wonder what the Value-added programs added involved?

Actually, Hittite has another, really hidden positive on their site, and that is the, apparently, very subdued Career Opportunities. Apprehensively visiting, suddenly where there's a blossom of jobs. When looked at in April, these ranged from a director of marketing, a variety of RF product, sales, applications, project, test, modelling, and QA engineers, and even a web programmer. Now that really looks like sound and solid growth. [http://www.hittite.com]